

## How many subspecies of Coal Tit *Periparus ater* are there in Iran?

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**SUMMARY.**—We discuss subspecific limits in Coal Tit *Periparus ater* in Iran and immediately adjacent regions. Three races are generally accepted as occurring in the country, one of them, *P. a. phaeonotus*, known only from four specimens collected in the Zagros Mountains of south-west Iran. We speculate that the type series of the latter taxon might have been incorrectly labelled as to date, and that the species is only a rare winter visitor to this region of the country. The other subspecies listed as occurring in Iran, *P. a. gaddi* and *P. a. chorassanicus*, are only extremely doubtfully distinct from *phaeonotus*.

Numerous publications testify to the complexity of geographical variation observable in the Coal Tit *Periparus ater* (e.g. Snow 1956, Vaurie 1959, Shirihai & Svensson in prep.), a wide-ranging Palearctic species, from the British Isles east across Eurasia to Kamchatka and Japan, and south to north-west Africa, the northern Middle East, the northern Himalayas and Taiwan (Harrap & Quinn 1996). The most recent treatments recognise either 20 (Harrap & Quinn 1996) or 21 subspecies (Dickinson 2003, Gosler & Clement 2007), subdivided into six groups by several authors, including Harrap & Quinn (1996), although the necessity of recognising all these groups, never mind subspecies, is not always clear, given that most described variation is clinal (Snow 1997, Kirwan *et al.* 2008). The last-named work is the most recent to have discussed racial limits within the so-called 'Caucasus group', whose constituents range from the Crimea of southern Russia to south-west Turkmenistan. Here, we further discuss the subspecific question within Iran.

Three subspecies are generally recognised for the populations in Iran: *Periparus a. phaeonotus* (Blanford, 1873) in the Zagros Mountains of south-west Iran; *P. a. gaddi* Zarudny, 1911, of the Elburz Mountains as far east as Gorgan in the southern Caspian Sea region (and south-east Azerbaijan); and *P. a. chorassanicus* Zarudny & Bilkevitch, 1911, which ranges through Khorasan province, in north-east Iran (and in the neighbouring mountains of south-west Turkmenistan). The first of these is by far the most fascinating of the trio, being known solely from four specimens, among them a syntype held at The Natural History Museum, Tring (BMNH 1874.11.23.35; Fig. 1), which was one of three collected in oak woodland near Shiraz at 1,525–2,135 m (29°37'N, 52°05'E; probably somewhere near Dasht-e Arjan, to the west of the city of Shiraz), by Major Oliver Beauchamp St. John in June 1870, according to the BMNH label. A colour illustration of the taxon by J. G. Keulemans appears in Blanford (1876). The fourth specimen was taken by Zarudny (1905) at the Gamdalkal Pass (31°53'N, 50°32'E), between Dow Polan and Dehdez, Fars province, on 2 January 1904 (modern dating) although the whereabouts of this individual, which is often overlooked in the literature (e.g. by Vaurie 1959, Harrap & Quinn 1996), are presently unknown. Enquiries at the following museums with large holdings of Zarudny's material, Bonn, Moscow, New York, St. Petersburg, Tashkent and Vienna, have failed to locate it. Warren & Harrison (1971) discussed the status of the Tring syntype, which was received on exchange from the Calcutta (formerly Indian) Museum. Both of the other syntypes were also held in Calcutta (Blanford 1876: 1, Sclater 1892: 74), but the latter museum reportedly



Figure 1. Syntype (BMNH 1874.11.23.35) of Coal Tit *Periparus ater phaeonotus*, collected in 'June' 1870, by Major Oliver Beauchamp St. John, near Shiraz, Iran (Guy M. Kirwan / © Natural History Museum, Tring)



Figures 2–3. Syntype (BMNH 1874.11.23.35) of Coal Tit *Periparus ater phaeonotus* (with red label) flanked by specimens of *P. a. gaddi*, collected in the southern Caspian region of Iran, showing ventral and dorsal surfaces (Guy M. Kirwan / © Natural History Museum, Tring)

no longer has any specimen of *P. ater* from Persia (Iran) (K. Deuti *in litt.* 2009).

Seven years after Zarudny collected his Zagros specimen, Witherby (1910) reported on a handful of specimens of Coal Tit collected by R. B. Woosnam in 1907 in the Elburz and southern Caspian, which he unhesitatingly assigned to *phaeonotus*, despite that Zarudny would, the following year, describe *P. a. gaddi* from the very same region. It is worth remarking that others had already ascribed to *phaeonotus* a much wider range than is currently accepted for this taxon. Thus, Seebohm (1883: 14) claimed that specimens from Lenkoran, Caucasus, could be considered representative of *phaeonotus*, and further stated (with supporting plumage



Figure 4. Syntype (BMNH 1874.11.23.35) of Coal Tit *Periparus ater phaeonotus* (at left) with three specimens of *P. a. chorassanicus*, collected in modern-day Turkmenistan, showing dorsal plumage (Guy M. Kirwan / © Natural History Museum, Tring)

detail) under *P. michailovskii* that this taxon 'is an intermediate form between *P. phaeonotus* and *P. ater*; and future researches will probably prove that these two forms are conspecific.' Dresser (1889: 88) also considered two males from Tiflis, Transcaucasia, to be *P. phaeonotus* and remarked that 'a comparison of [*P. michalowskii*] with the type of *P. phaeonotus* in the British Museum convinces me that the two forms cannot possibly be separated, as they are identical in coloration and do not differ in size.' Nonetheless, Hartert (1910: 360–361) upheld *michalowskii* and assigned the Lenkoran specimens (mentioned above) to this taxon. Zarudny (1911), in distinguishing his *gaddi* specimens from his own example of *phaeonotus*, remarked that the former had less extensive brown on the breast-sides and belly, and distinctly paler upperparts. Witherby (1910) already remarked that an error might perhaps have occurred in Blanford's type locality, and he further speculated that the species perhaps does not even occur in south-west Iran. Zarudny's specimen, already mentioned, presumably allayed such concerns, for the question of *phaeonotus* has since abated, although several commentators (e.g. Vaurie 1959, Harrap & Quinn 1996) have drawn attention to the failure of both subsequent collectors (e.g. Koelz) and experienced modern-day field workers, such as Derek Scott and Lindon Cornwallis, to find *P. ater* in the Zagros. As part of our ongoing museum work on Iranian birds, and at the prompting of our colleague K. Kratochwill (*in litt.* 2007), we decided to reinvestigate this issue, especially as it was apparently never truly examined by Vaurie (1957: 20).

We assembled relevant material at BMNH, namely their syntype of *phaeonotus*, eight specimens of *gaddi* and eight specimens of *chorassanicus*, for study. Figs. 1–4 shows the *phaeonotus* syntype compared to representative material of the other two Iranian subspecies. *P. a. phaeonotus* has almost invariably been considered either to have the brownest upperparts of the entire Caucasus group (Snow 1956, Harrap & Quinn 1996) or at least to be browner or darker than other Transcaucas and Transcaspians taxa (Vaurie 1959, Gosler & Clement 2007). However, in considering these and other comparisons, including our own, it is vital to recall that virtually all 20th-century and some 19th-century commentators have

TABLE 1

Comparative published and unpublished mensural data for three taxa of Coal Tits *Periparus ater* in Iran; all measurements in mm. Authors' data (all measurements by GMK): wing = max. chord, and bill = to skull.

Source — ! Taxon	Authors' data	Snow (1956)	Harrap & Quinn (1996) ( <i>n</i> = unknown)	Shirihai & Svensson (in prep.)
<i>Periparus ater phaeonotus</i>				
Wing	67 (♂)	-	c.67–70 (♂♂)	-
Tail	46 (♂)	-	-	-
Bill	10.83 (♂)	-	-	-
<i>P. a. gaddi</i>				
Wing	66–69 ( <i>n</i> =5)	67.5–70.0 (3 ♂♂) 64.5–66.0 (4 ♀♀)	65–70 (♂♂) 63–70 (♀♀)	64.5–70.0 ( <i>n</i> =8)
Tail	44.0–47.5 ( <i>n</i> =5)	-	-	45–48 ( <i>n</i> =8)
Bill	10.54–11.98 ( <i>n</i> =5)	-	-	-
<i>P. a. chorassanicus</i>				
Wing	67.5–69.5 (3 ♂♂) 66.5–67.5 (4 ♀♀)	66–70 (7 ♂♂)	66–70 (♂♂)	-
Tail	45.0–49.5 (3 ♂♂) 46.5–49.5 (4 ♀♀)	-	-	-
Bill	11.22–11.67 (3 ♂♂) 10.57–11.55 (4 ♀♀)	-	-	-

relied on the single *phaeonotus* syntype now in Tring. Harrap & Quinn (1996) considered the upperparts to be slightly more cinnamon-brown than *gaddi*, but such elements are variably present in both *gaddi* and *chorassanicus* (Figs. 2–4). Vaurie (1959) considered *chorassanicus* to be marginally greyer above than *gaddi*, but such distinction is equally not apparent in the Tring material examined by us. Whereas Vaurie (1959) was content to remark that *phaeonotus* was slightly paler below than *gaddi*, Harrap & Quinn (1996) and Gosler & Clement (2007) noted that the paler buff on the flanks reaches to the undertail-coverts; Fig. 2 demonstrates that *gaddi* and *phaeonotus* are very similar in respect of underparts coloration and pattern, and *chorassanicus* is probably indistinguishable from either in these respects. The one difference that might be sufficient to distinguish *chorassanicus* from both *phaeonotus* and *gaddi* is the slightly narrower bill (*cf.* Fig. 4), a character already noted by Snow (1956) and Vaurie (1959) but seemingly ignored by subsequent commentators. Though we did not attempt to quantify this difference, we doubt its significance. (It might also be worth noting that Dementiev & Gladkov 1954 had already elected to synonymize *chorassanicus* with *P. a. michalowskii* (Bogdanov, 1879) of the Caucasus and central and eastern Transcaucasia.) Our own and others' measurements (see, e.g., Snow 1956, Harrap & Quinn 1996; and Table 1) suggest more or less complete overlap between all three Iranian taxa in wing and tail lengths.

That specimens from the Elburz and Zagros Mountains appear more or less identical becomes less surprising when we reconsider the available evidence for the species' presence in the latter range. Given that Coal Tits are capable of performing quite long-range eruptive, latitudinal, and shorter-range altitudinal movements (see, e.g., Gosler & Clement 2007), and vagrants have reached as far afield as Israel (Shirihai 1996), Zarudny's midwinter specimen from the Zagros might easily have been an accidental migrant. St. John's midsummer specimens, however, are harder to explain, except that, as already correctly noted by Witherby (1910), the available syntype BMNH 1874.11.23.35 is in very fresh plumage, which seems most atypical if it was indeed taken in June. Moulting in *P. ater* generally commences in late May and can continue until late September or early October (Harrap & Quinn 1996). Given that St. John (a) reported several taxa of principally or exclusively northerly distribution in the Zagros in summer, for instance European Robin *Erithacus rubecula*, (b) that some of these specimens were brought to him by a native collector, such that (c) it would have therefore been easy for mistakes of dating between the Gregorian and Islamic calendars to have occurred, we suggest that it is difficult to be unequivocal about the dating of the *P. a. phaeonotus* syntype, especially given its plumage state. From the 320 specimens collected by Blanford and St. John received from the India Museum by the British Museum (and now held at Tring), it is obvious that St. John was collecting birds in the environs of Shiraz from at least June to December (*pers. obs.*). Moulting in some of the other Paridae (e.g. a Great Tit *Parus major* and a Sombre Tit *Poecile lugubris*) taken by St. John in this region in June also appears to be well advanced, at least compared to our knowledge of the moulting regimes of these species in Europe (Flegg & Cox 1969, Dhondt 1981, Svensson 1992). This might, of course, merely reflect the different regime of populations in southern Iran. Nonetheless, a mistake in the specimen's date appears to us to require as much elimination as the alternatives, i.e. that *Periparus ater* has, since the early 20th century, become extinct in the Zagros, or that the considerable subsequent field work has failed to locate any breeding population there of an obvious species. If the Zagros birds were all non-breeders, the question arises as to their breeding grounds. Given the syntype's close match for specimens of *gaddi* we consider it likely that its origin was elsewhere in (northern) Iran. Until better evidence becomes available, we recommend that *P. a. phaeonotus* be considered an apparently rare visitor to the Zagros Mountains, and that *P. a. gaddi* be treated as a

synonym of *phaeonotus*, whilst *P. a. chorassanicus* is only very doubtfully distinct from other specimens taken elsewhere in northern Iran.

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#### References:

- Blanford, W. T. 1873. Description of new species of *Nectarinia*, *Sitta*, and *Parus* from Persia and Baluchistan. *Ibis* (3)3: 86–90.
- Blanford, W. T. 1876. *Eastern Persia: an account of the journeys of the Persian Boundary Commission 1870–72*, vol. 2. Macmillan, London.
- Dementiev, G. P. & Gladkov, N. A. 1954. [*The birds of the Soviet Union*], vol. 5. Nauka, Moscow.
- Dhondt, A. A. 1981. Postnuptial moult in Great Tit in southern Sweden. *Ornis Scand.* 12: 127–133.
- Dickinson, E. C. (ed.) 2003. *The Howard and Moore complete checklist of the birds of the world*. Third edn. Christopher Helm, London.
- Dresser, H. E. 1889. Notes on birds collected by Dr. G. Radde in the Transcaspien region. *Ibis* (6)1: 85–92.
- Flegg, J. J. M. & Cox, C. J. 1969. The moult of British Blue Tit and Great Tit populations. *Bird Study* 16: 147–157.
- Gosler, A. & Clement, P. 2007. Family Paridae (tits and chickadees). Pp. 662–750 in del Hoyo, J., Elliott, A. & Christie, D. A. (eds.) *Handbook of the birds of the world*, vol. 12. Lynx Edicions, Barcelona.
- Harrap, S. & Quinn, D. 1996. *Tits, nuthatches and treecreepers*. Christopher Helm, London.
- Hartert, E. 1910. *Die Vögel der paläarktischen Fauna*, Bd. 1(3). R. Friedländer und Sohn, Berlin.
- Kirwan, G. M., Boyla, K. A., Castell, P., Demirci, B., Özen, M., Welch, H. & Marlow, T. 2008. *The birds of Turkey: the distribution, taxonomy and breeding of Turkish birds*. Christopher Helm, London.
- Slater, W. L. 1892. On the Indian Museum and its collection of birds. *Ibis* (6)4: 65–87.
- Seeböhm, H. 1883. Notes on the birds of the Caucasus. *Ibis* (5)1: 1–37.
- Shirihai, H. 1996. *The birds of Israel*. Academic Press, London.
- Shirihai, H. & Svensson, L. In prep. *Photographic handbook to the birds of the Western Palearctic*, vol. 1. Christopher Helm, London.
- Snow, D. W. 1956. Geographical variation in the Coal Tit, *Parus ater* L. *Ardea* 43: 195–226.
- Snow, D. W. 1997. Should the biological be superseded by the phylogenetic species concept? *Bull. Brit. Orn. Cl.* 117: 110–121.
- Vaurie, C. 1957. Systematic notes on Palearctic birds. No. 27 Paridae: the genera *Parus* and *Sylvoiparus*. *Amer. Mus. Novit.* 1852: 1–43.
- Vaurie, C. 1959. *The birds of the Palearctic fauna: Passeriformes*. H. F. & G. Witherby, London.
- Warren, R. L. M. & Harrison, C. J. O. 1971. *Type-specimens of birds in the British Museum (Natural History)*, vol. 2. Trustees of the Brit. Mus. (Nat. Hist.), London.
- Witherby, H. F. 1910. On a collection of birds from the south coast of the Caspian Sea and the Elburz Mountains, with field notes by R. B. Woosnam. *Ibis* (9)4: 491–517.
- Zarudny, N. 1905. [Itinerary of the voyage to western Iran in the year 1903–1904]. *Ezhegodnik' Zoologicheskago Muzeya Imperatorskoi Akademii Nauk* 9: XLV–LI. [In Russian.]
- Zarudny, N. 1911. Verzeichnis der Vögel Persiens. *J. Orn.* 59: 185–241.
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